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ROTARY LATERAL CURVATURE OF THE SPINE,
AND
ITS TREATMENT BY REMEDIAL GYMNASTICS.

A CLINICAL LECTURE DELIVERED AT THE POLYCLINIC HOSPITAL.

BY

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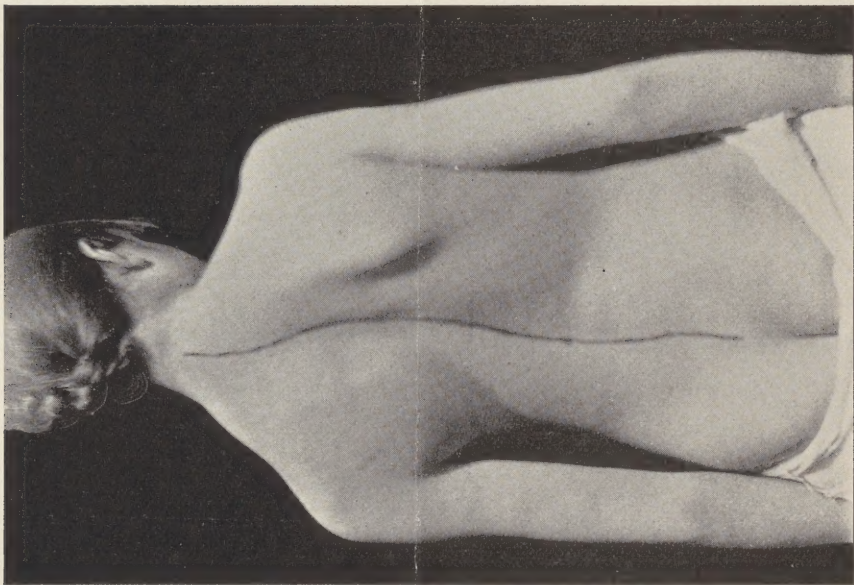


FIG. 1.—Idiopathic rotary lateral curvature.

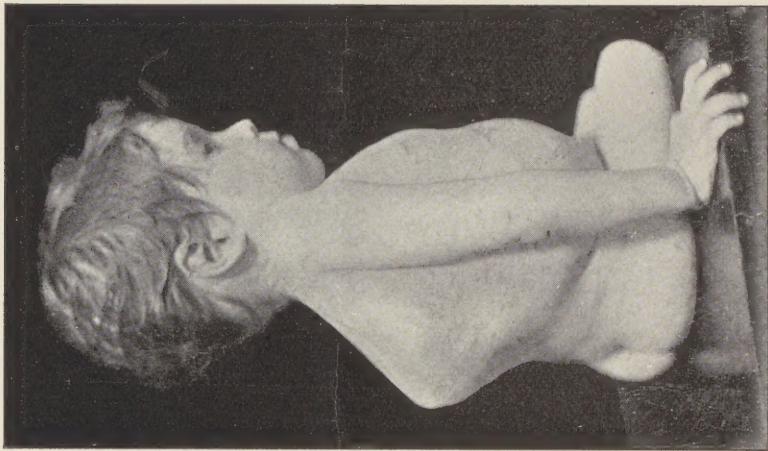


FIG. 2.—Posterior angular curvature produced by tubercular caries.

ROTARY LATERAL CURVATURE OF THE SPINE, AND ITS TREATMENT BY REMEDIAL GYMNASTICS.

FOR want of time I shall not be able to speak of the pathology or etiology of rotary lateral curvature, but direct attention especially to the cases which are classed as idiopathic. These are the cases which generally occur in young school-girls who, by errors of posture in sitting at their desks, standing, or lying in bed, have acquired faulty positions of the spinal column. There are almost invariably to be found a systemic debility and absence of correlation of muscular forces. The muscles or groups of muscles do not work in unison, in opposing each other, but by their unequal action the over-active groups tend to produce primarily asymmetrical conditions due to the inability of the patient to maintain a correct posture, and there follows an alteration in the relationship naturally existing between the axes of the hips and the shoulders. The alteration of the axes referred to is as conspicuous a factor in the production of rotary lateral curvature as inequality in the length of the legs, or other asymmetrical conditions, which are well-known and recognized causes of this deformity. The ultimate effect of this prolonged alteration of the natural position of the body is to produce changes in the natural shape and contour of the vertebrate bodies. These become wedge-shaped, being compressed upon the concave side, or the side where the pressure is greatest; or, as taught by some, the bony growth is more rapid upon the convex side, the side where the pressure is least.

This alteration of the bones of the spinal column indicates the existence of a softened condition of these structures, and such must be the case, or it would be impossible to explain the production of those serious deformities which are so often found. I have alluded to the lateral curvature only, and will now direct attention to the existence of rotation as a most conspicuous element in these cases. The rotation ultimately becomes fixed because the bones of the spinal column become permanently deformed, and there is generally an increase in rotation as well as in lateral curvature.

With these few preliminary remarks, let us study the clinical features of the patient before you. First, we may eliminate inequality in the length of the legs, as we observe that the hips present a perfectly normal aspect. The right shoulder occupies a position higher than normal, and the left shoulder is depressed to a corresponding degree, the head being carried to the

right side, so as to have the centre of gravity placed in its natural position, midway between the hips. It will be observed that the right shoulder-blade is in an altered position as compared with that of a normal scapula, for its upper and outer border at the shoulder-joint is thrown forward, while the apex is thrown posteriorly. The left shoulder is held anterior to its normal position and the apex of the left scapula is also anterior to its normal position.

By placing the first and second fingers of the left hand one upon each side of the spinous processes, and carrying them downward from the cervical region, it will be found that as the patient stands before you there is a deviation, which is clearly indicated by the line on her back (Fig. 1), and a small curve in the cervical region, with the convexity to the left side, while the lateral curvature is greatest in the dorsal region, with the convexity towards the right side. There is also a small amount of curvature in the lower dorsal and lumbar region, with the convexity to the left. It will thus be seen that there are three curves present, the most exaggerated being in the mid-dorsal region. The lateral curvature will account for the high right shoulder and the lower left shoulder, but will not explain the position of the shoulder-blades,—why the apices of the scapulæ are forced into the false position which they here occupy. Again, with the fingers upon the spinous processes as above, it will be found that, as the examination proceeds towards the mid-dorsal region, the line of the spinous processes, instead of being in a direct line anteriorly and posteriorly, as in the upper cervical and lower lumbar vertebræ, corresponds with a line drawn from the left side of the body posteriorly to the right side anteriorly, diagonally, thus demonstrating the presence of the phenomena of rotation. This rotation of the bodies of the vertebræ naturally carries with it a rotation of the articulation of the heads of the ribs attached to the vertebræ that are rotated. This rotation, therefore, carries the ribs into a plane posterior to their normal position upon the right side and into a position anterior to their normal position upon the left side. This will explain the prominent scapula upon the right side and the depression which makes the left scapula so inconspicuous.

With the patient's arms held high over the head she will bend forward, flexing her spine so as to make as great an arch as possible; and in this position it will be observed that the spinous processes are all in a direct line, as they would be in a normal body. The prominence of the scapula of the right side has been removed and the back appears to be that of a normal person; but as soon as she assumes the erect position, the clinical features to which I have directed attention are again assumed.

You will observe that, while she is apparently well formed, the muscular development is very slight. She quickly assumes an indolent position in which all the features of her deformity are greatly exaggerated, and while she possesses the ability temporarily to hold herself quite straight, it lasts but a moment, and therefore her deformity has the ten-

dency to rapid increase. The examination of her muscles develops the fact that they are all feeble in their action, although it is impossible clearly to demonstrate any absolute deficiency. The erector spinæ mass appears more prominent upon the left side because the lumbar vertebræ are rotated into such a position as to throw into prominence the muscles and fat overlying it.

Such, therefore, are the clinical features of this case, and the question for consideration will be the remedial measures for her recovery, as well as for the prevention of the increase of her deformity. As the deformity has been produced by muscular inability to hold the trunk erect, it is clearly indicated that we must attack the muscular development if we would have any hope of producing a permanent result. Braces constructed of steel, plaster of Paris, in fact, every conceivable variety of material have been resorted to for the purpose of holding the spine erect, with the hope of preventing an increase in the bony deformity, but invariably with results so disastrous as to warrant a careful consideration of their inefficiency, and, I might say, of their effect in increasing the deformity.

Simply holding the spine, whether by means of braces or by preventing the patient from standing, or by forcing her to continue for a long time to occupy the position of recumbency, will naturally diminish the activity of all those muscles which have for their object the maintenance of the erect position. So, while the deformity may be *concealed* by apparatus, the moment the apparatus is taken away the patient falls into the faulty position again, because she lacks the ability to hold herself erect. It is, therefore, absolutely essential that anything that tends in the direction of muscular disuse should be dispensed with as quickly as possible. It must be borne in mind that the application of braces in incipient cases is here condemned, though the occasional necessity for rigid mechanical appliances in cases where great deformity has resulted is well recognized.

Not alone is it unscientific and irrational in these cases to use braces, corsets, or tight clothing of any kind, but the muscles should all have free play, with no more covering than the exigency of the case may require. A patient with rotary lateral curvature, in as feeble condition as the one before you, will not be able to take severe gymnastic exercise of any kind, but must have developmental exercises of a progressive character, carefully selected to suit the requirements of her individual case. It is just as important for such a patient to have an individual study and application of remedial measures as it would be were she afflicted with any disease, and therefore it is important for us to consider the advisability of sending such a patient to a gymnasium or of placing her under the care of any one not skilled in medical science. For the reasons already stated, such patients should not be given exercise in classes, for what may suit one may seriously injure another. It is, therefore, strongly urged that individual, studious, and prolonged attention be given to the development of her muscular system. It is not wise to attempt to develop only those muscles which are weak or acting inefficiently, because I believe that the weakened

muscles can be brought into action and into the proper relationship with opposing muscles and groups better by a development of the entire body, gradually produced.

It will very quickly become monotonous and tend to a discontinuance of the exercises if but a few muscles are developed by movements which are in themselves tiresome; but by changing the form of the movements and going from one extremity to another, the patient will quickly become interested in her work, and development will thereby be more rapidly increased. A feature in the recovery of these cases by developmental gymnastics is the power of the mind over the body. Unless the physician can obtain the hearty co-operation of the patient, the determination to do all that is required and in the way specified, it is absolutely useless to attempt any treatment. As soon, however, as this co-operation and confidence in the physician is obtained, simple calisthenic movements or some form of Swedish movements can be taught (in one's office or at the patient's home) very much in the same way that a lesson is given in music, the patient then being allowed to practise for a period of a week before a rehearsal is given by the physician, when new movements and new applications can be made. Ordinarily I direct the patient to begin with a half-hour every night and morning, and to increase the time as her strength develops. This period of exercise should be followed by a cold sponge-bath, a quick rub-down with a coarse towel, and repose in recumbency for fifteen to twenty minutes.

It has been a matter of very great satisfaction to me to see patients who were before unable to carry on the ordinary avocations of school-girl age develop a robust and vigorous system, and not only to observe the rapid development of the muscular system, but also to see the curvature gradually diminish and finally disappear.

Referring again to what I said in the early part of this lecture, about the softened condition of the bones, it will be apparent that active destruction of the normal contour of the bones may be produced by excessive efforts at gymnastics. It is very largely for that reason that it is wise to dispense with all forms of gymnastic apparatus and machinery, and to rely entirely upon the patient's body for weight, and upon the natural action of the muscles in opposing each other for the development of the entire system, for then the conditions are well suited to the requirements of the patient, and change as the patient becomes stronger.

This plan of gymnastic development of the muscular system for the correction of rotary lateral curvature is applicable only to those cases of spinal curvature which are produced by conditions other than tubercular osteitis, and the phenomena should be clearly demonstrated before such activity of the spinal column is permitted.

Not only is the plan of treatment spoken of as applicable to the correction of rotary lateral curvature inapplicable to the treatment of the curvatures produced by tubercular caries of the spine, but the rational plan of

treatment for tubercular caries of the spine would be inapplicable to rotary lateral curvature.

It is, therefore, of the utmost importance that a careful diagnosis be made in the beginning, so as to avoid the mistake of confusing rotary lateral curvature with the curvatures of Pott's disease or those produced by tuberculous caries of the spine. I have seen a great many patients, with active inflammatory bone-diseases produced by a tubercular osteitis, who have been treated by the methods of gymnastic development inappropriately applied to their cases, with the result of rapid increase in the deformity, produced by the breaking down of the tubercular bone. Well-marked cases, such as is shown in Fig. 2, produced by tubercular osteitis of the spinal column, and patients with considerable rotary lateral curvature cannot be mistaken, but the difficulty of making a diagnosis in the very incipiency of either of these troubles is sometimes exceedingly great.

The little patient whose condition you observe in Fig. 2 has a posterior angular curvature produced by the destruction of the bodies of the dorsal vertebræ which are involved in tuberculous caries. You will see that he is carefully supporting his upper trunk by means of his arms placed upon the table. He is one in whom an erroneous diagnosis was made, and is an illustration of the ultimate deformity that may result. His own posture indicates clearly what his case requires, and had his actions guided those in the care of his case early in its history, he would have had mechanical support and fixations instead of being allowed freedom of movement.

Time will not permit, this afternoon, of a more detailed study of the differential diagnosis of slightly-marked deformities of the spinal column, but enough has been said, I think, to direct careful attention to the necessity for early diagnosis and to the application of remedial gymnastics in rotary lateral curvature, together with the avoidance of anything which restrains free movement.

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BY

HENRY W. CATTELL, A.M., M.D.

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